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Author: Ladislav Kavan Paul Liska Shaik M. Zakeeruddin Michael Graetzel

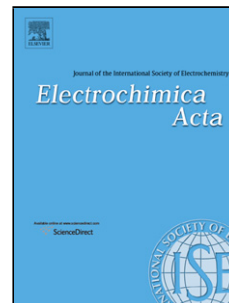
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Low-temperature Fabrication of Highly-Efficient, Optically-Transparent (FTO-free) Graphene Cathode for Co-Mediated Dye-Sensitized Solar Cells with Acetonitrile-free Electrolyte Solution

Ladislav Kavan^{1,2*}, Paul Liska¹, Shaik M. Zakeeruddin¹ and Michael Graetzel¹

¹*Laboratory of Photonics and Interfaces, Institute of Chemical Sciences and Engineering, Swiss Federal Institute of Technology, CH-1015 Lausanne, Switzerland*

²*J. Heyrovský Institute of Physical Chemistry, v.v.i., Academy of Sciences of the Czech Republic, Dolejškova 3, CZ-18223 Prague 8, Czech Republic*

*e-mail: kavan@jh-inst.cas.cz

Highlights

- Graphene-modified stainless steel (in the form of woven fabric) is applicable as a cathode in Co-mediated dye-sensitized solar cells with acetonitrile-free electrolyte solution.
- Graphene oxide, either pure or in composites with graphene nanoplatelets or with stacked graphene fibers are efficient electrocatalysts for these cathodes.
- The composite electrodes prepared at temperatures $\leq 200^\circ\text{C}$ show comparable or even better performance than the thermally platinized FTO.

ABSTRACT

Propionitrile electrolyte solutions mixed with sulfolane or with 1-ethyl 3-methyl imidazolium tetracyanoborate (ionic liquid) are optimized for $\text{Co}(\text{bpy})^{3+}/\text{Co}(\text{bpy})^{2+}$ -mediated DSCs working at low illumination intensity. Highly-active cathode catalysts based on graphene oxide, either

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